



**PROPOSED PHOTOVOLTAIC SOLAR ENERGY FACILITIES (PEFS) AND
GRID CONNECTIONS NEAR WELKOM, FREE STATE PROVINCE:
KHAUTA SOLAR PV CLUSTER.**

Plant Species, Terrestrial Biodiversity Theme and Faunal Species Site
Verification Report

February 2022

Prepared for:



Prepared by:

Megan Smith

Megan.smith@enviroworks.co.za

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DOCUMENT CONTROL

Quality and revision record

Quality approval

	Capacity	Name	Signature	Date
Author:	Environmental Specialist (MSc Biological Sciences, UCT 2019)	Megan Smith		12/05/2022
Reviewer 2	Director of Enviroworks, SACNASP Registered (400328/11)	Elbi Bredenkamp		12/05/2022

This report has been prepared in accordance with Enviroworks Quality Management System.

Revision record

Revision Number	Objective	Change	Date
1	General Formatting	Format, grammar, spelling	07/02/2022
2	Update report based on additional specialist studies.	Update of recommendations and no-go areas.	10/05/2022
3	Update report based on additional specialist studies.	Update of recommendations and no-go areas.	12/05/2022

DISCLAIMER

Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time, and budget. Discussions are to some extent made on reasonable and informed assumptions built on bona fide information sources, as well as deductive reasoning. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage during the impact assessment phase. The author does not accept responsibility for conclusions made in good faith based on own databases or on the information provided. Although the author exercised due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of this document. This report should therefore be viewed and acted upon with these limitations in mind.

1. PROJECT DESCRIPTION

Enviroworks (Pty) Ltd has been appointed by WKN WindCurrent (Pty) Ltd to conduct a Plant, Animal - and Terrestrial Biodiversity Theme site verification on the following photovoltaic (PV) solar installations and associated grid line connections on various properties near Welkom, Free State Province:

- 3 x 100MW PV Solar Installations (each approximately 200 hectares)
- 2 x line route options for the 132kV line (approximately 10 kilometres) (150m corridor to be assessed on either side of the proposed line)
- 2 x 19.9MW PV Solar Installations (approximately 36 hectares)
- 1 x line route options for the 44kV line (approximately 9 kilometres) (150m corridor to be assessed on either side of the proposed line)

2. METHODOLOGY

To verify the desktop assessment ¹, a site visit was conducted during 17 and 19 January 2022. During the site visit, the proposed development footprints for the Solar PV and association transmission line route options were driven and surveyed on foot. The objective of the survey was to determine wherever there was a change in habitat or where areas of conservation importance were mapped (at least 10% of the total footprint was surveyed). While driving, roadside surveys were conducted during which dominant species and general habitat condition were recorded. When surveying the area on foot, the various plant and animal species on site were recorded, taking note of the dominant species and habitat condition. Photos were taken on site to record any plant (i.e., flora)- and animal (i.e., fauna) species on site. Species recorded on site were identified down to the lowest taxonomic level, where possible. The presence of avifauna has not been discussed in this report as it is expected to be covered in the separate avifaunal verification report.

- To determine the threatened or protected status of any faunal and floral species identified on site the following was used:
 - International Union for Conservation of Nature (IUCN)²
 - Red List of South African Plants ³
 - The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa⁴

¹ Enviroworks, "Plant Species, Terrestrial Biodiversity Theme and Faunal Desktop Assessment Report: PROPOSED PHOTOVOLTAIC SOLAR ENERGY FACILITIES (PEFS) AND GRID CONNECTIONS NEAR WELKOM, FREE STATE PROVINCE: KHAUTA SOLAR PV CLUSTER," 2021.

² "IUCN 2020," The IUCN Red List of Threatened Species. Version 2019-3., accessed July 29, 2020, <https://www.iucnredlist.org>.

³ N.A Nick and D Raimondo, "National Assessment: Red List of South African Plants Version 2020.1.," 2007.

⁴ M.F Child et al., *The Red List of Mammals of South Africa, Swaziland and Lesotho* (South African National Biodiversity Institute and Endangered Wildlife Trust, 2016).

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- Southern African Reptile Conservation Assessment⁵
- Free State Nature Conservation Ordinance (8 of 1969).

3. SITE VERIFICATION OF SENSITIVE AREAS AND ECOSYSTEMS OF THE SITE

3.1 100MW PV Solar Installation and 19.9 MW PV Solar Installation

Based on the site inspection, the sites can be verified to be mixture of mostly natural terrestrial areas interspersed with old lands and areas associated with wetlands (Figure 1) on a mostly flat topography with slightly undulating hills. Based on satellite imagery, the old lands were left to passively rehabilitate less than 10 years ago. The properties are currently being used for cattle and game farming. However, grazing intensity is expected to be low based on the high diversity of indigenous plants.

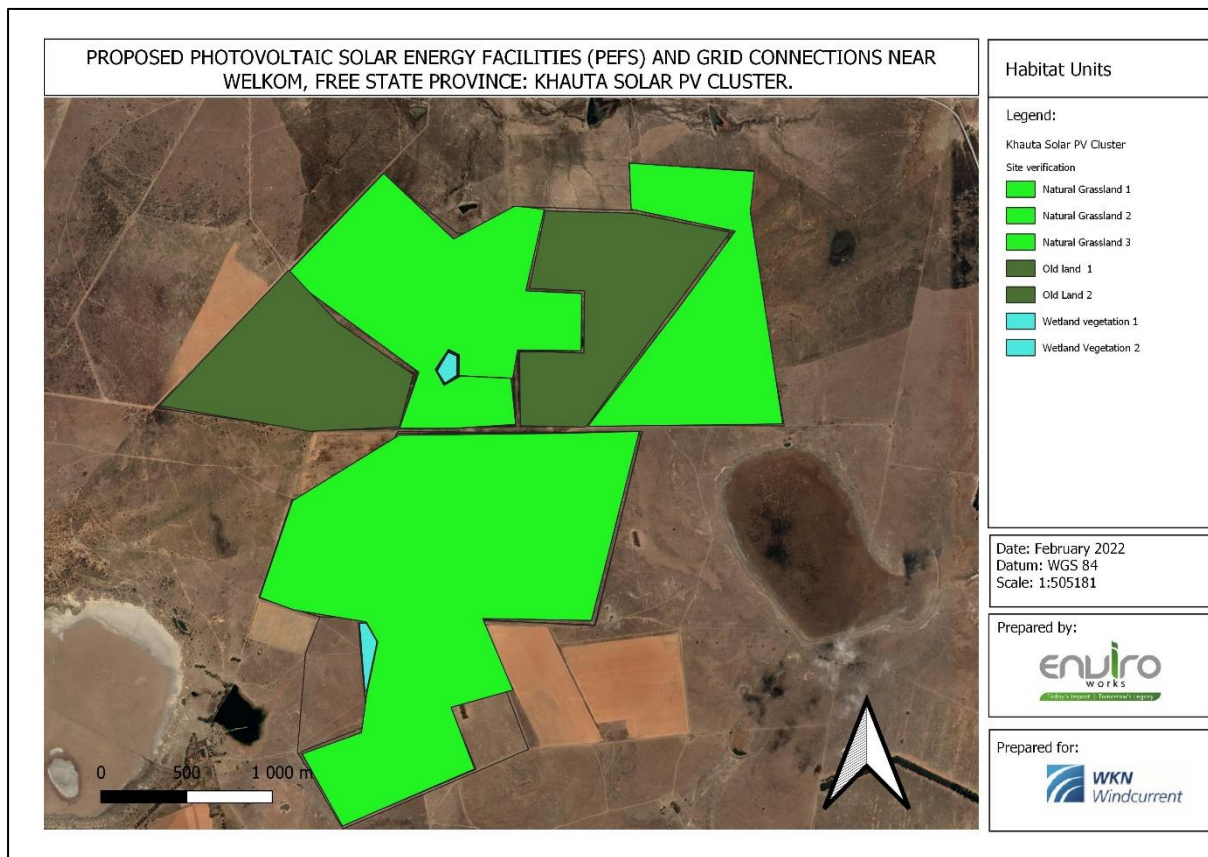


Figure 1: Habitat Units within the Solar Photovoltaic (PV) development footprints (3 x 100MW and 2 x19.9 MW).

Habitat 1: Natural grasslands

These areas are dominated by indigenous species such as *Themeda triandra*, *Cymbopogon sp.*, *Panicum coloratum*, *Cynodon sp.* (Figure 2). Although the development footprint is mapped within the Highveld Alluvial Vegetation type, the vegetation found on site is more botanically representative of Western Free State Clay

⁵ M.F Bates et al., *Atlas and Red List of the Reptiles of South Africa, Lesotho, and Swaziland* (Animal Demography Unit and South African National Biodiversity Institute, 2014).

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Grassland or Central Free State Grassland^{6 7}(both classified as Least Threatened), due to soil's high clay content (confirmed by the Aquatic Biodiversity Specialist) and the dominance of *Themeda triandra* and *Cymbopogon* sp., and the low abundance of trees. There are, however, areas that have a high abundance of *Vachelia karoo* which is most likely a result of increased moisture in the soil or clay. The description of the vegetation on site was confirmed by consultation with a Grassland specialist (G Bredenkamp, pers. comm) and the Aquatic Biodiversity Specialist.



Figure 2 Example of vegetation in Habitat Unit 1: Natural grasslands.

⁶ Nacelle Collins, "Free State Biodiversity Plan" (Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs., 2016).

⁷ L Mucina and M.C Rutherford, *The Vegetation of South Africa, Lesotho and Swaziland*, Strelizia 19 (Pretoria: South African National Biodiversity Institute, 2006).

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Areas mapped as natural and are located in sensitive areas (i.e., Critical Biodiverse Areas (CBA), Other Natural Areas, and Ecological Support Areas (ESA); see Figure 3 below) are considered to be ecologically significant. These areas provide a habitat to a high diversity of faunal and floral taxa and support important ecological processes and ecosystem services. It is recommended that these areas are not disturbed as far as practically possible or at least very minimally disturbed.

Areas classified as an ESA 1 or 2 have been classified based on the presence of wetland clusters (as per the Free State Biodiversity Plan, 2015). Therefore, by preserving areas verified to be watercourses (as per the Aquatic Biodiversity Verification Report, EcoFocus, 2022) and the associated water quality buffers, the main function of the ESA 1 and 2 are preserved. Based on the aforementioned, ESA 1 and 2 areas can be reduced to areas delineated as watercourses and their associated buffers (see Figure 6).

In terms of threatened fauna, suitable habitat and the presence of *Smaug giganteus* (classified as Vulnerable⁹ and is provincially protected by the Free State Nature Conservation Ordinance (8 of 1969)) was confirmed by a taxon specialist (Figure 4). The specialist noted only two sites that inhabited burrows that are in current use. These burrows are outside of development (See demarcated areas in green in Figure 4). Surrounding these confirmed burrows is suitable habitat for the species of approximately 70 hectares in size (in total) (although more area is most likely available).

The CBA 1 areas within the development footprint have been mapped primarily due to the presence of suitable habitat for *Smaug giganteus* (as per the Free State Biodiversity Plan, 2015). Given that suitable habitat has been demarcated to areas outside the mapped CBA1, it is now noted that there is a mismatch in the verified environmental conditions and the desktop assessment. Based the aforementioned, areas classified as suitable habitat are now seen as new demarcations of CBA1 areas within the development footprint.

No sightings or burrows in current use were recorded in areas demarcated as suitable habitat within the development footprint (Figure 4). Because these areas do not currently inhabit *Smaug giganteus*, the probability of any individuals inhabiting the area in the future is low.

⁹ "IUCN 2020."

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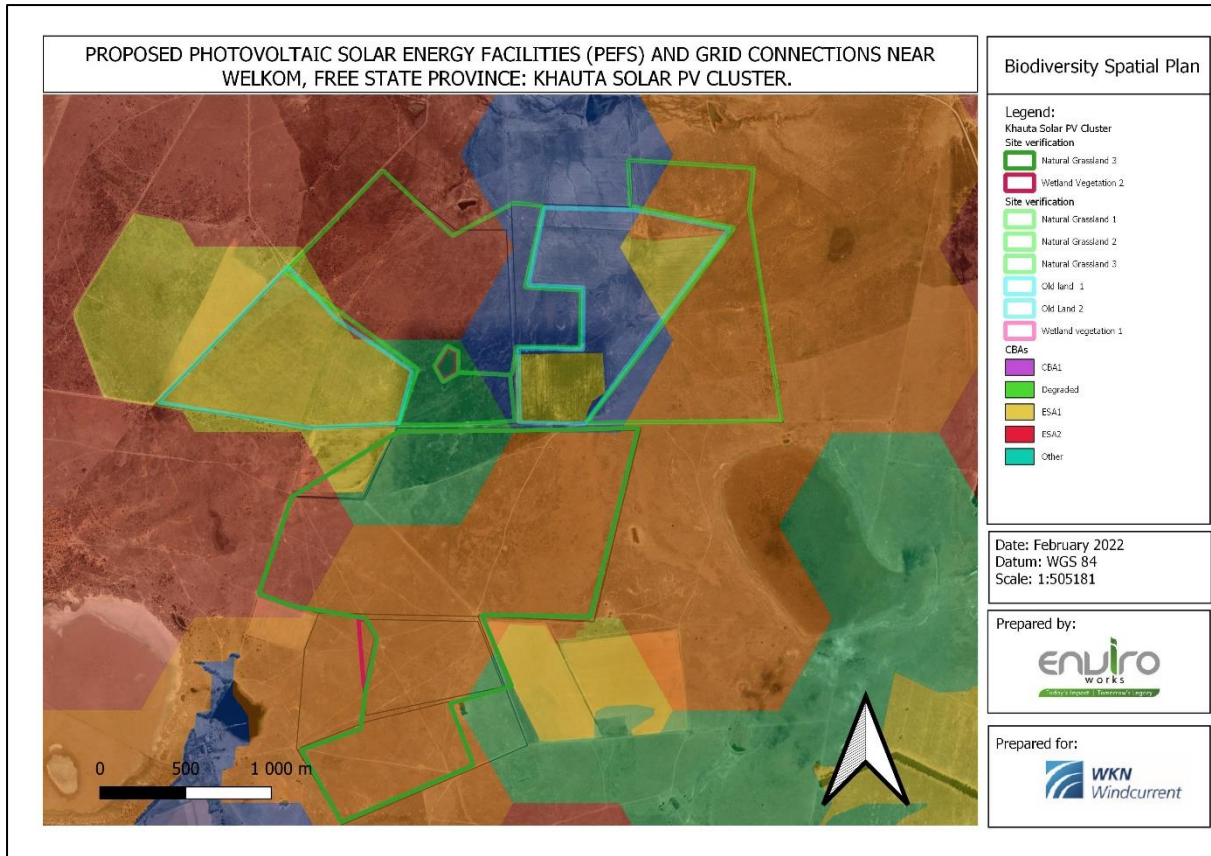


Figure 3 Biodiversity Spatial Plan for various habitat units identified in the Solar Photovoltaic development footprints

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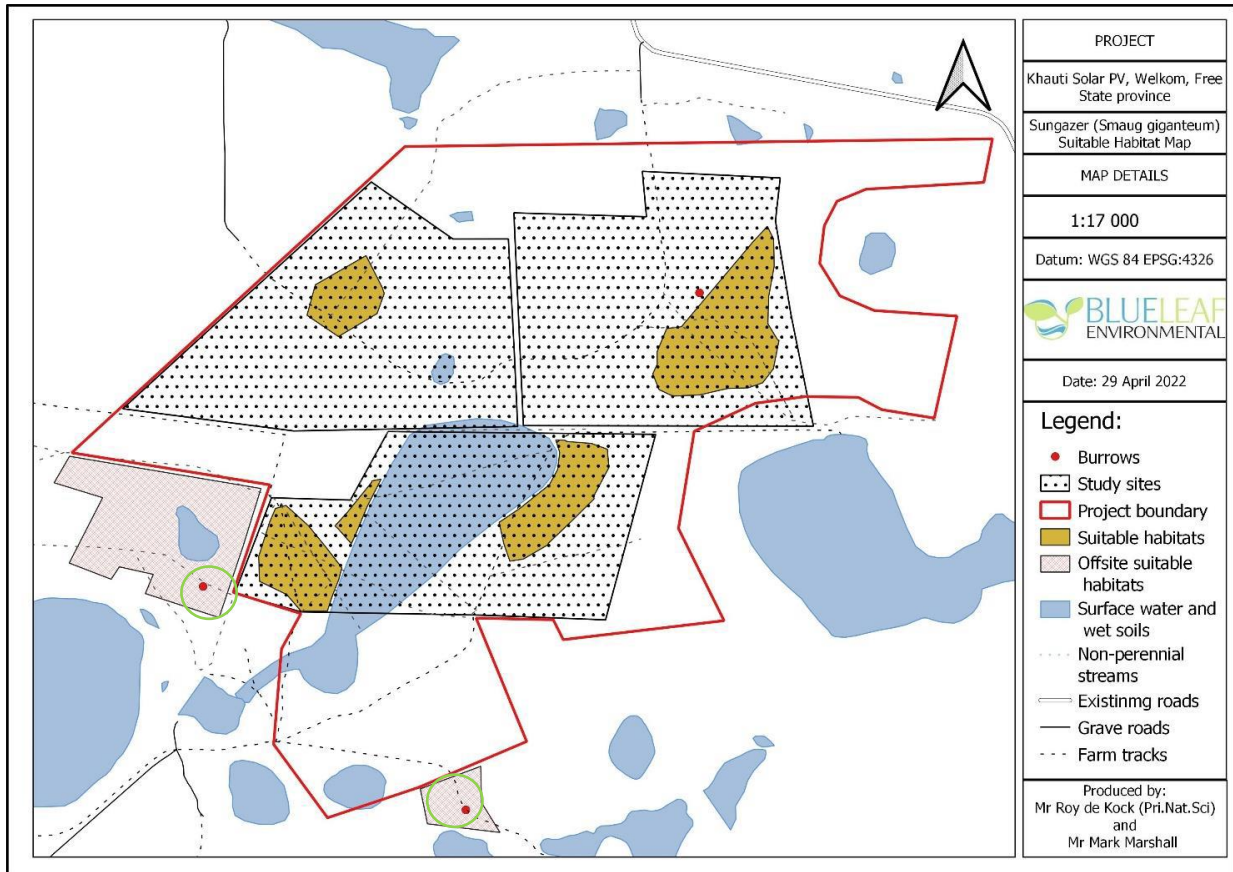


Figure 4 Confirmed evidence (i.e., burrows) of Smaug giganteus and confirmed suitable habitat for the species. Burrows in currently in use are demarcated in green.

From a Botanical perspective, no threatened species were recorded within Habitat Unit 1. However, several provincially protected plant species, as per the Free State Nature Conservation Ordinance (8 of 1969), were recorded including *Gladiolus permeabilis*, *Brunsvigia sp.*, and *Helichrysum sp.*

In terms of general fauna, a variety of fauna were recorded on site including *Stigmochelys pardalis*, *Danus chrysippusa*, *Amietia delalandii* and *Hystrix sp.* From the fauna that were recorded on site, *Stigmochelys pardalis* is listed as provincially protected as per the Free State Nature Conservation Ordinance (8 of 1969). One individual of *Stigmochelys pardalis* was located in the CBA as mapped in Figure 3.

Habitat Unit 2: Old lands

The old lands were verified to be rehabilitated grassland that are less than 10 years old. Although these areas are not considered “natural vegetation” as per the National Environmental Management Act (Act 107 of 1998), these areas are similar in species composition to Habitat Unit 1 (Figure 2 and 5) and are expected to function in a similar manner. Therefore, old lands are considered to be successfully rehabilitating and are likely to support a variety of faunal and floral species and contributed to the overall ecological significance of the area. No threatened or protected species were recorded within these old lands.



Figure 5 Example of vegetation within Habitat Unit 2: Old lands

Habitat Unit 3: Wetland areas (now considered to be areas classified as ESA 1 and 2)

Various areas have been delineated as wetlands (see Figure 6), as per the Aquatic Biodiversity verification report (EcoFocus, 2022). Given that the most of these areas are only seasonally wet/periodically wet, much of these areas do not differ in vegetation from Habitat Unit 1 (this does not negate their ecological importance). From a botanical perspective, the wetland areas marked in Figure 1, are different to Habitat Unit 1 and thus, have been discussed in this section. Habitat Unit 3 is dominated by *Panicum coloratum*, *Eragrostis curvula*, *Berkheya rigida*, *Gomphocarpus* sp., and especially species often associated with wetlands including *Carex* sp. and *Cyperus echinatus* (Figure 7). Although these areas mostly inhabit common, non-threatened species, one provincially protected species (As per the Free State Nature Conservation Ordinance (8 of 1969)) was recorded, *Ammocharis coranica*.

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In terms of fauna, the delineated wetland within the footprint are likely habitats and food resources for a variety of reptiles, insects, amphibians, avifauna and small mammals. During the site visit, *Tyto capensis*, *Pyxicephalus adspersus*, and a variety of insects, including Dragonflies, were recorded during the site survey. The presence of amphibians and Dragonflies indicate that the delineated wetlands are in a natural/near natural state and thus, it is expected that these ecosystems are highly productive and will be integral components to the overall ecological functioning of the area. Moreover, wetlands delineated with CBAs or ESAs are of particular importance because they are located in areas that are ecologically and biologically sensitive.

As mentioned in the above sections, the areas mapped as ESA 1 and 2 have been delineated based on the presence wetland clusters. Therefore, to retain the functions of the ESAs, the wetlands/watercourses and buffers must be conserved (Figure 6). Based on the aforementioned, ESA 1 and 2 areas can be reduced to areas delineated as watercourses and their associated buffers (see Figure 6).

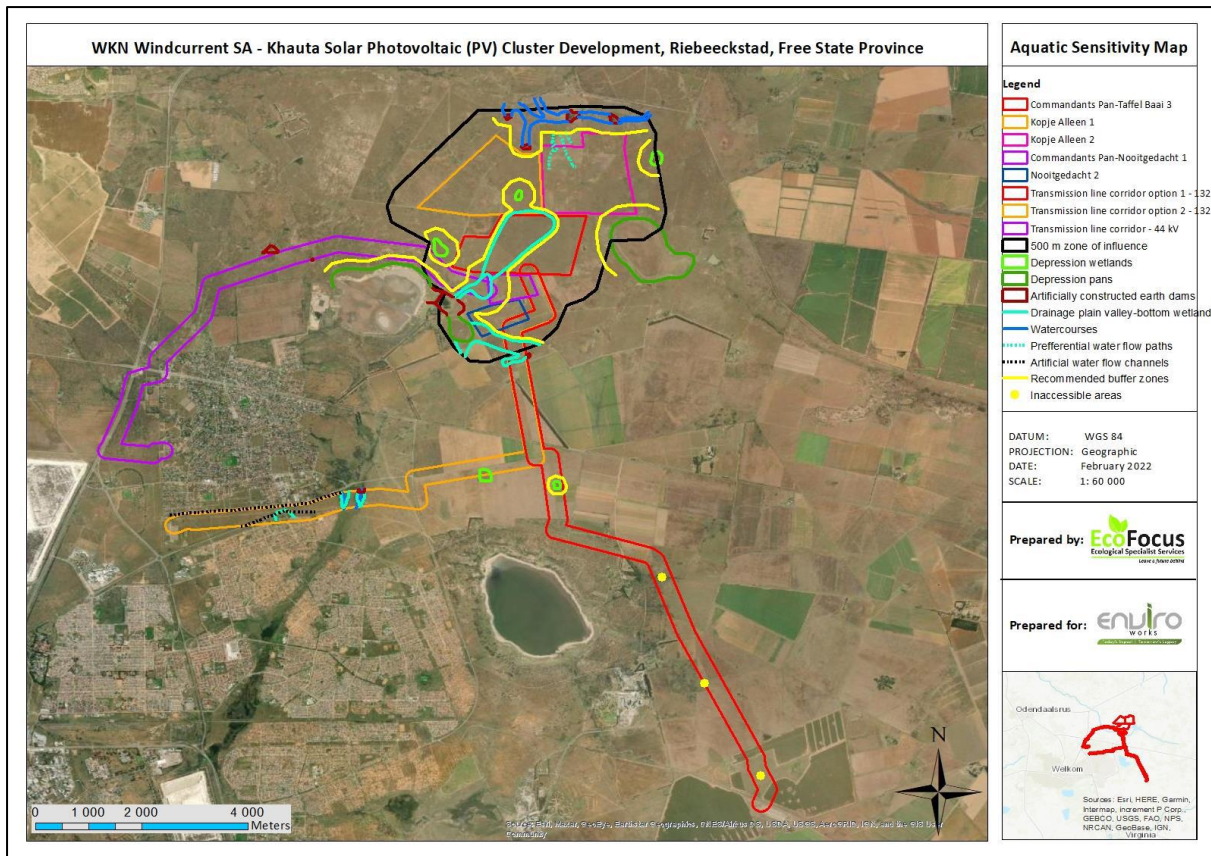


Figure 6 Aquatic site sensitivity map illustrating the approximate delineations of all the identified watercourses, wetlands and other significant aquatic features found to be present throughout the different assessment areas and proposed transmission line route (EcoFocus, 2022)



Figure 7 Example of vegetation within Habitat Unit 3: Wetland areas.

3.1.1 Recommendations

Given the above, ideally the Ecological Support Areas (ESA 1), wetlands, and Critical; Biodiverse Area (CBA 1) would be avoided completely (see Figure 3). However, should the need and desirability of the development be significant enough to warrant the clearance of the areas of conservation value, the following would be preliminary recommended.

- All delineated watercourses, considered to be ecologically significant in the Aquatic Biodiversity Assessment Report, and their buffer areas are identified as no-go areas (See Figure 8). This would be especially significant in all areas delineated as ESA1 and 2. Given that the ESA1 and 2 have been delineated to preserve the NFEPA wetland clusters, any areas that would prevent sedimentation (i.e., reduction of water quality) into the wetlands must be preserved. This will retain the functionality of the ESAs.
 - o To ensure connectivity between watercourses, corridors have been recommended. These corridors are recommended to be at least 300 m to ensure the movement of fauna, seed dispersal and that edge effects are considered.
 - The 300 m corridor is justified given that:
 - It is the migration of only plants, reptiles, insects, and small mammals that need be accounted ¹⁰for (note that avifauna have not been considered at

¹⁰ Andrew Bennet, "Habitat Corridors and the Conservation of Small Mammals in a Fragmented Forest Environment," *Landscape Ecology* 4 (1990).

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- this stage) because the footprints no longer inhabit natural populations of large mammals.
- Edge effects have been taken into account ¹¹
 - It is strongly recommended that areas between solar panels be kept as natural as possible.
 - There are large natural areas adjacent to the corridors that would act as suitable habitat for any species that may be displaced.
- It must be noted that where corridors can be negotiated within other properties, it may change the corridor routes for some areas within the proposed development footprint (see Figure 8).
- Based on input from the provincial Department's Biodiversity Specialist, it is not recommended that the area demarcated as CBA1 be developed because it is potential habitat for *Smaug giganteus* (and is irreplaceable). Based on Section 3.1, new CBA1 areas have been demarcated based on suitable habitat for *Smaug giganteus* (Figure 4).
- Areas within the development footprint that have been earmarked as potential habitat for *Smaug giganteus*, are recommended to be surveyed prior to construction.
 - Should individuals be utilising these areas of suitable habitat, it is then recommended that the individuals be located to outside of the footprint (in consultation with a Faunal Specialist). Data on the translocation success of the species are limited, but studies¹² show that translocations are generally unsuccessful. However, these studies primarily relocated individuals to artificial burrows. Therefore, suggesting that relocation to suitable, undisturbed, and wild habitat would result in successful translocation.
 - Based on the above, it is recommended that funding be allocated towards developing a successful translocation protocol for the proposed development. This will then involve translocation individuals to suitable habitat outside of the development footprint as indicated in Figure 4.
- Areas of suitable habitat for *Smaug giganteus* (and are now considered CBA1 areas) within the development footprint have been recommended by the taxon specialist not to be excluded from the development footprint. Therefore, some suitable habitat for *Smaug giganteus* will be lost within the development footprint. The aforementioned has been deemed acceptable for the following reasons/recommendations:
- No sightings or burrows in current use were recorded in areas demarcated as suitable habitat within the development footprint (Figure 4).

¹¹ David Holway, "Edge Effects of an Invasive Species across a Natural Ecological Boundary," *Biological Conservation*, 2005.

¹² G.H Groenewald, "The Relocation of *Cordylus Giganteus* in the Orange Free State, South Africa: Pitfalls and Their Possible Prevention" (The Journal of the Herpetological Association of Africa, 1992).

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- Suitable habitat outside of the development footprint and outside of the mapped CBA1 area is recommended to be conserved by the landowners. These areas will then be considered offsets as the function of the CBA1 will be retained, but in an area outside of a mapped and verified CBA1 area.
- Although approximately 90 hectares of CBA 1 areas will be potentially lost by the development, this will then be off-setted by conserving approximately 70 hectares of suitable habitat (and thus CBA 1 areas) outside of the development footprint.
- It is in the professional opinion of the taxon specialist, that individuals may inhabit areas underneath or in between the solar panel during operations.
 - All solar panels will be mounted on aboveground steel frames lifting these panels off the ground surface. This means that the ground footprint of the Solar PV facility will be relatively small. The Applicant will also have to keep the grass underneath these panels short, creating potential safe habitats for *Smaug giganteus*.
- Furthermore, the areas mapped as a suitable habitat on the development footprint in Figure 4 is completely isolated and thus, resulting in fragmented habitats. Fragmented habitats are usually vulnerable to edge effects, population inbreeding, and potential reduced prey. Overall, the probability of negative impacts on the potential colonies (should any be found on the areas of suitable habitat on the development footprint) is high. Conserving an island of potential habitat within the current development footprint would, therefore, not retain the function of the CBA1.
- In order to determine the impact that the proposed development will have on the areas of conservation concern, a full botanical, faunal, and terrestrial impact assessment is required.
- All recommendations from the Avifaunal Specialist site verification report must implemented. The development footprints are ideal habitats for a variety of indigenous birds, some of which may be threatened or protected. During the site visit, individuals of *Tyto capensis* and *Sagittarius serpentarius* (classified as Vulnerable¹⁴) were recorded.
- It is recommended that areas between the rows of solar panels be kept as natural, were possible, as possible to ensure that as much ecological significant land can be preserved. An operation management plan should be developed for the areas to ensure the areas are managed in a way that preserves their ecology.
- Plant removal permits must be obtained from the Free State Department of Economic Development, Tourism, and Environmental Affairs for protected species that will be removed.

¹⁴ "IUCN 2020."

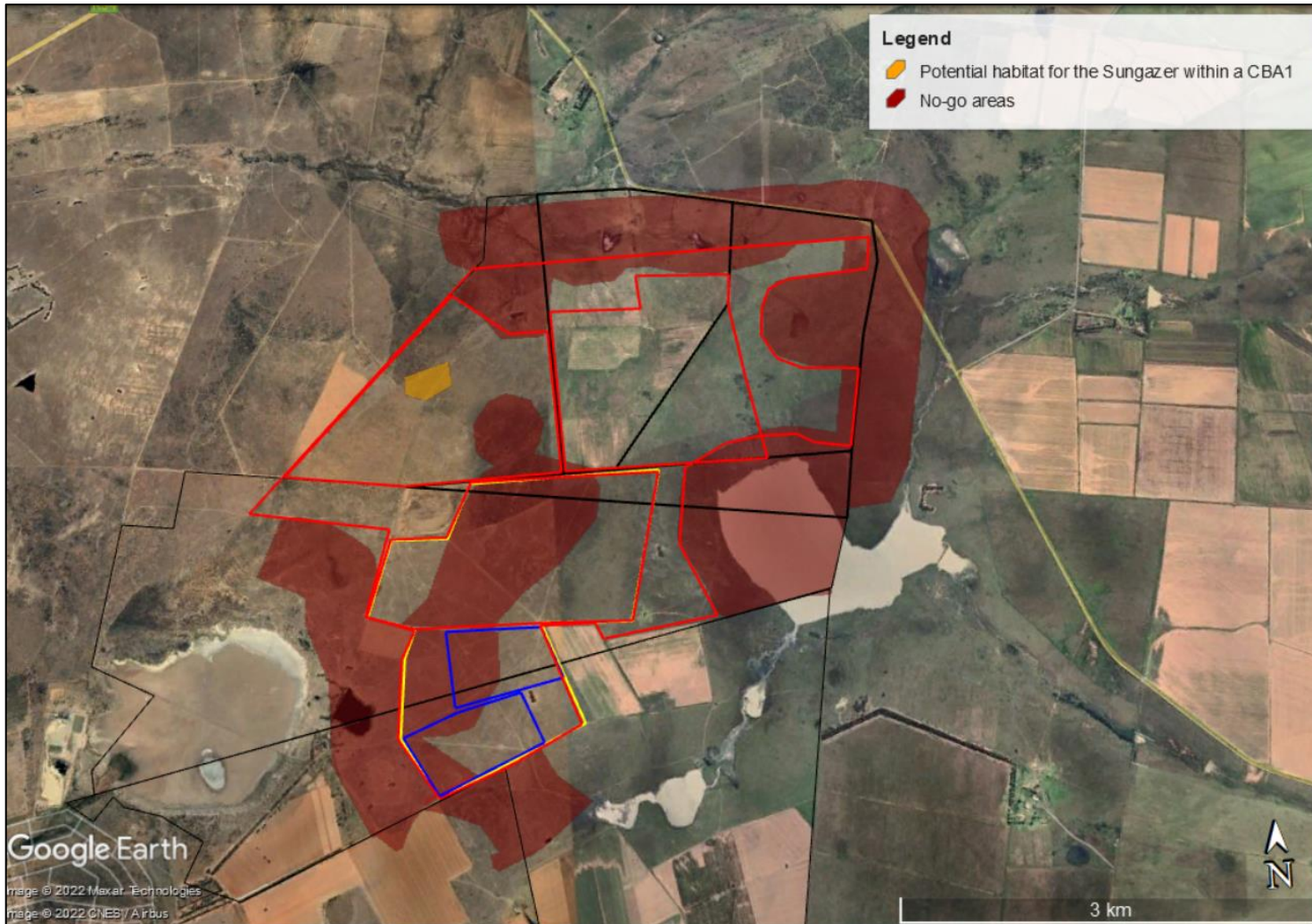


Figure 8 Recommended no-go areas (demarcated in red) and potential no-go areas (demarcated in orange) within the solar PV farm development footprints (2 x 100 MW (red line) (this includes additional development footprints considered by the Applicant) and 2 x 19.9 MW (blue lines). Black polygons represent the landowner properties.

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3.2 Line route options for the 132kV and 44 kV transmission lines

Based on the site inspection, the areas within all the route options (Figure 9) have been verified to be overall a mixture of mostly degraded or completely transformed areas (via cultivation or roads) and/or are adjacent to roadsides and residential areas. However, there are areas that are natural/near natural which are usually also associated with wetlands as delineated by the Aquatic Biodiversity Specialist (Figure 6).

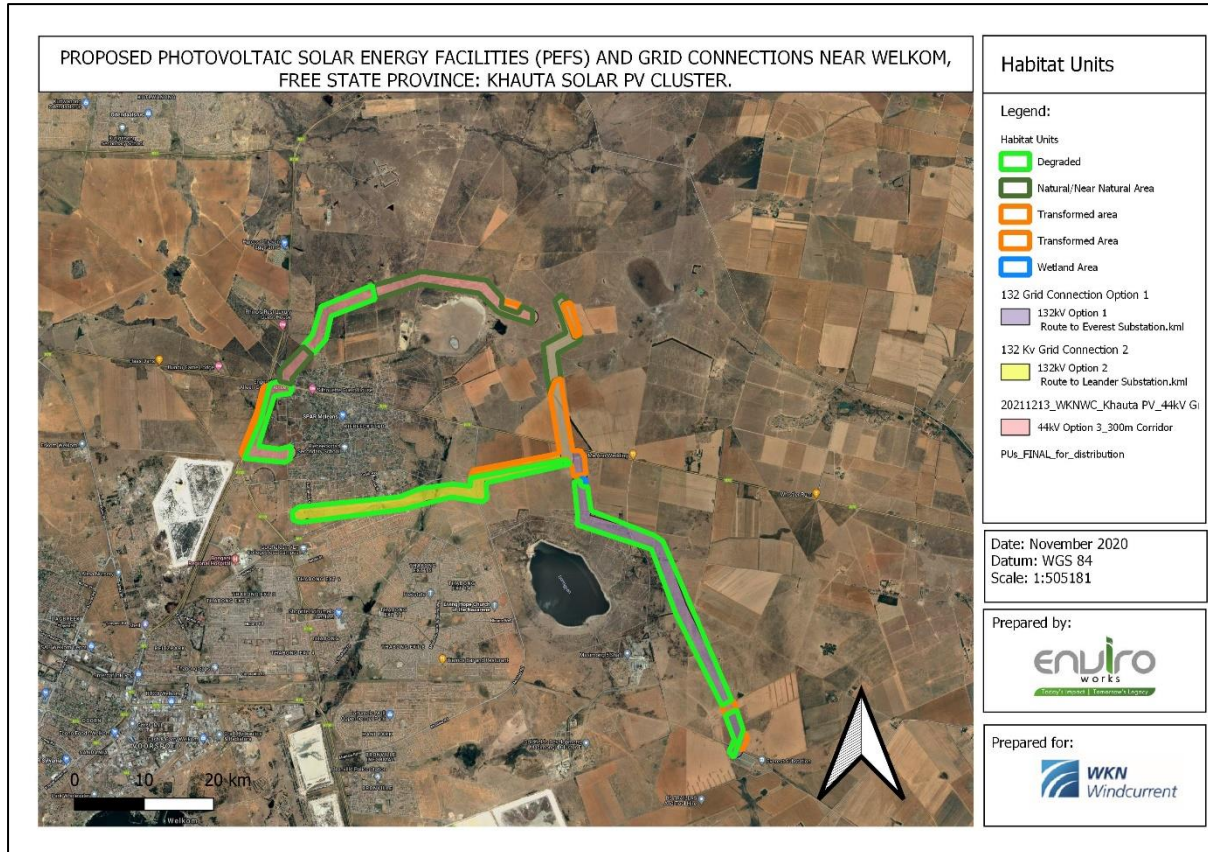


Figure 9 Habitat Units identified within the proposed transmission line (2 x 132 kV and 1 x 44 kV) route options and 300 m buffer area.

Habitat Unit 1: Degraded Areas

Areas that are degraded show signs of disturbance mostly via the dominance of *Cynodon dactylon*, *Erigeron canadensis*, and *Helichrysum arenarium* and the presence of alien invasive species including *Cirsium vulgare* (Category 1b) (Figure 11). However, other indigenous plant species were recorded including *Panicum coloratum* and *Eragrostis curvula*. In the northern most degraded area, disturbance is illustrated via bush encroachment (Figure 10) and the dominance of *Vachelia karoo*, *Asparagus* sp., and *Tagetes minuta*, in addition to the aforementioned species. Within the degraded areas, it is expected that limited faunal activity takes place and thus, the areas are expected to support some ecological processes, but not enough to warrant them ecologically significant. Although these areas inhabit some indigenous species, the composition of these species are not representative of the indigenous vegetation types, Vaal-Vet Sandy Grassland or Alluvial Highveld Alluvial

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Vegetation. It must be noted that one provincially protected species was recorded in these areas, *Helichrysum arenarium*. No threatened species were recorded within the degraded areas.

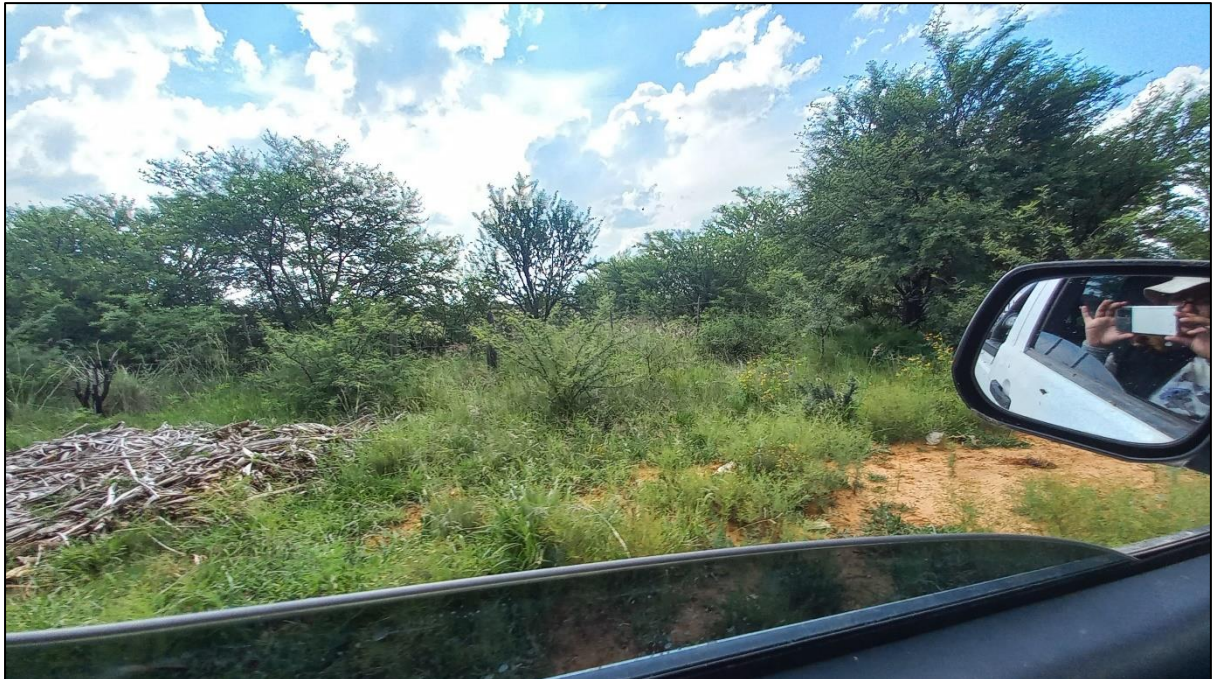


Figure 10 Example of degraded areas with bush encroachment.



Figure 11 Example of degraded areas without bush encroachment.

Habitat Unit 2: Transformed Areas

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Areas identified as transformed have no natural ecosystems or vegetation as a result of cultivation or infrastructure such as roads (Figure 12). These areas contain little to no vegetation or fauna and are not representative of the indigenous vegetation type and has no ecological value.



Figure 12 Example of transformed areas indicating intensive crop farming.

Habitat Unit 3: Natural/ near natural areas

Natural/near natural areas within the western section of the proposed transmission route options are dominated by indigenous species such as *Vachelia karoo*, *Panicum coloratum*, *Searsia sp.*, *Eragrostis curvula*, *Cynodon sp.* (Figure 13). Given the high abundance of *Vachelia karoo* and proximity to watercourse, it is likely that the vegetation could be representative of Highveld Alluvial Vegetation. There is also a section that includes a koppie (Figure 14), which is expected to provide essential habitat for a variety of reptiles, insects, and birds. In the eastern sections of the proposed transmission route options, the area is dominated by *Themeda triandra* and is botanically and pedologically (mostly that it is high in clay content) similar to Habitat Unit 1 (Section 3). Therefore, this area is likely to support western Free State Clay Grassland or Central Free State Grassland (both classified as Least Threatened).

Importantly, both the eastern and western sections of the transmission line route options are classified as a Critical Biodiverse Area 1 (CBA1) (in the eastern section) and Ecological Support Area 1 (ESA 1) (in the western section) and thus have high conservation value (Figure 15). Both eastern and western sections areas are likely to support a high diversity of indigenous faunal and floral species. No threatened plant species were observed on site, but one protected species was recorded, *Brunsvigia sp.* Therefore, Habitat Unit 3 holds significant ecological value and is likely to provide essential ecosystem services.



Figure 13 Example of typical vegetation in Habitat Unit 3: Natural/ near natural areas.



Figure 14 Example of typical vegetation on the koppie within Habitat Unit 3: Natural/ near natural areas.

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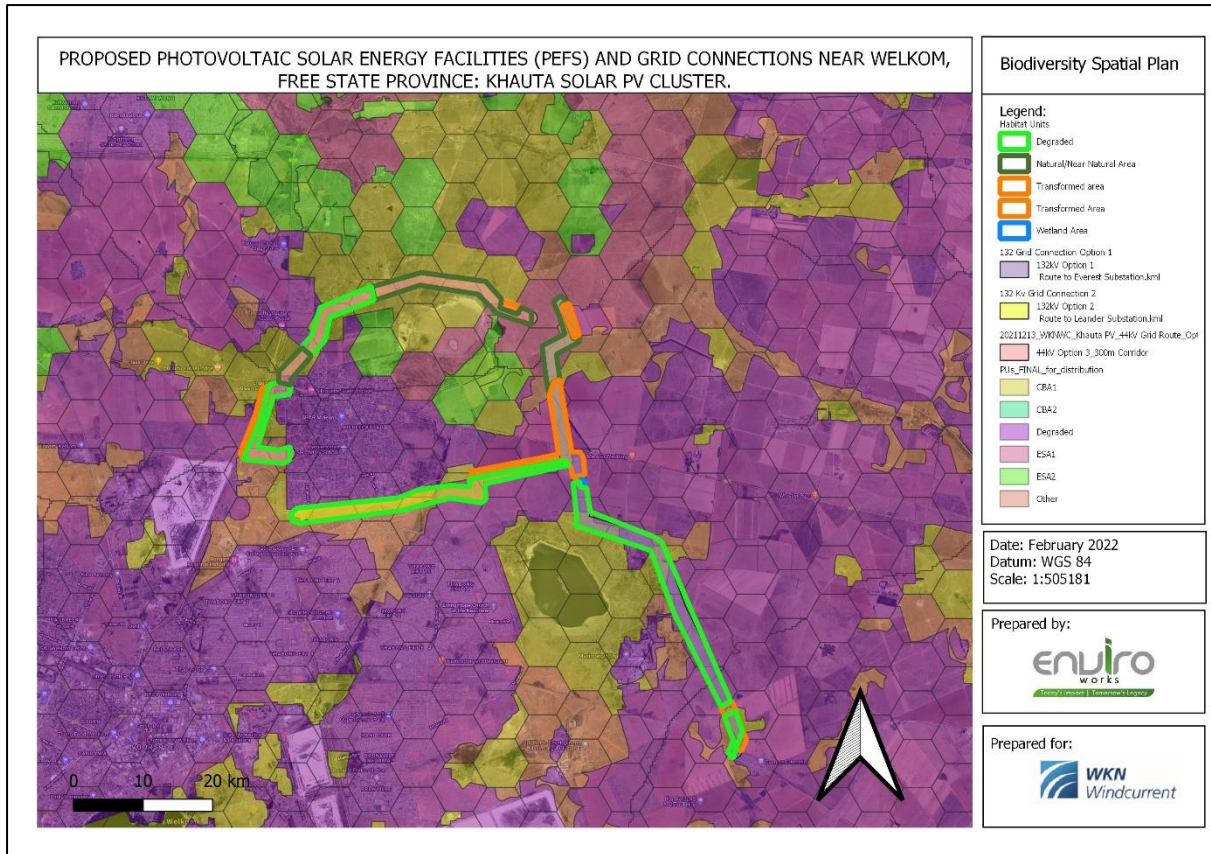


Figure 15 Biodiversity Spatial Plan for the proposed transmission line routes (2 x 134 kV and 1 x 44kV lines).

Habitat Unit 4: Wetland Areas

It is noted that various watercourses have been delineated on the proposed development footprints (Figure 5; EcoFocus, 2022). These watercourses have similar vegetation to Habitat Unit 1, besides the wetland demarcated in Figure 16 where the vegetation is representative of Habitat Unit 1 (Section 3). The watercourses do provide essential habitat to various faunal species but are mostly isolated (besides the wetland demarcated in Figure 15) resulting in fragmented habitats and are often the only habitat refuge for faunal species. This makes the preservation of the watercourses important. From a botanical and faunal perspective, these watercourses are unlikely to support threatened or protected species, but still do provide essential ecosystem services. The wetland demarcated in Figure 16 is located in an ESA and thus, is expected to form an integral part of the overall ecological importance of the area. This wetland is in a natural state and thus, supports a host of fauna and flora and provides essential ecosystem services such as habitat to fauna in the wider area.

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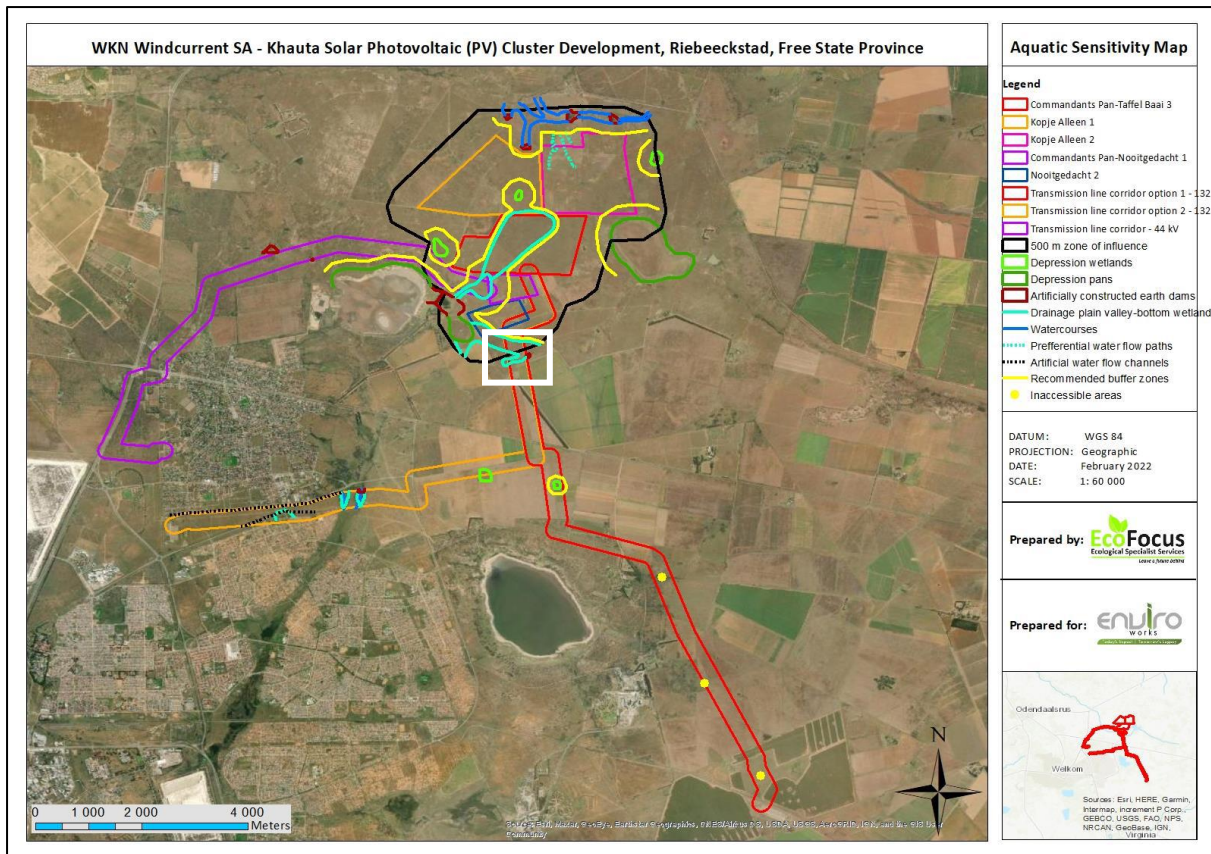


Figure 16 Delineated watercourse (demarcated in white), located in the 132kV option 1 (orange) and 2 (red) proposed routes, within an Ecological Support Area.

3.2.1 Recommendations

Given the above, the following recommendations and conclusions are applicable:

- Overall, the loss in biodiversity and ecological significant areas would be moderate given that limited areas are usually disturbed during the installation and operations of transmission lines.
- Nevertheless, areas classified as an ESA or CBA and are natural/near natural should ideally be avoided as far as practically possible. This is especially important given the large areas of CBAs/ESAs that will be cleared during the installation of the Solar PV farms.
- However, should areas within the ESA1 need to be developed, all delineated watercourses and their respective buffer areas must remain no-go areas. This will preserve the functioning of the ESA since it has been delineated due the presence of NFEPA¹⁶ wetlands.
- Should areas within the CBA be required for the development of transmission lines, it is likely that the impact of these areas be minimal and the loss in vegetation is expected to be accepted. The aforementioned is to be confirmed via a full Faunal and Botanical and Terrestrial Biodiversity Impact Assessment.

¹⁶ "Council for Scientific and Industrial Research. NFEPA River FEPAs 2011 [Vector Geospatial Dataset]," 2011.

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- All recommendations within the Aquatic Biodiversity verification report must be adhered to.
- All recommendations within the Avifaunal verification report must be adhered to.
- Areas classified as degraded and have high levels of plant diversity should ideally also be avoided especially if there are other route options that are located in areas that have been completely transformed.
- In terms of the 132 kV line route options both routes are expected to have similar impact on Terrestrial Biodiversity, Faunal Species and Plant Species. However, given that Option 2 will traverse through more vegetated areas (surrounding the Doringpan), it is recommended that Option 1 be developed. However, should Option 2 be developed outside of the vegetated areas, either route option will be acceptable in terms of Terrestrial Biodiversity, Faunal Species and Plant Species impacts.
- It must be noted that areas within the proposed 132 kV line routes that have also been earmarked as potential off set sites, should be avoided (Figure 4). Although the powerline is expected to have minimal impact on the suitable habitat of *Smaug giganteus*, these areas are expected to be conserved in their entirety.
 - o Should a different route/avoidance of the offset areas not be feasible, additional offset areas must be determined to ensure enough suitable habitat for *Smaug giganteus* is available.
- Plant removal permits must be obtained from the Free State Department of Economic Development, Tourism, and Environmental Affairs for protected species that will be removed.

4. CONCLUSION

Taking into consideration the sensitivity of the development footprint, sensitive features verified during the site inspection, the results from the baseline biodiversity and ecosystem of the site, it can be concluded that most of the proposed development sites have some ecological sensitivity (Animal Species, Plant Species or Terrestrial Biodiversity). Nevertheless, the preliminary 'no-go' areas identified are regarded as sufficient in preserving the ecological importance of the habitat units within the proposed development footprints (this pending further assessments to determine the full extent of the impact of the proposed developments).